Forest Health Protection
Pacific Southwest Region

Date: August 30, 2019
File Code: 3400

To: Carolyn Napper, SMMU Ranger, Shasta-Trinity National Forest

Subject: McCloud Compound

At the request of Anders Dombrowski, a site visit was made to the McCloud Compound, Shasta-Trinity National Forest, on August 28, 2019. The objectives were to assess the current insect and disease conditions and recommend treatments.

Background

Anders Dombrowski initially contacted me regarding the possibility of using fungicide spray on ponderosa pine for Diplodia blight. I worked with Plant Pathologists in the Region with the Regional Pathologist providing: "I really don't worry much about Diplodia. Sure it can be spectacular….visible from hundreds of yards away…..but usually the trees recover very nicely and there are no long-term form problems associated with this disease." The disease is common in ponderosa pine following long, wet springs and where spacing is tight and poor air circulation leads to susceptible foliage.

A site visit was planned when Plant Pathologist, Bill Woodruff made himself available to come out to McCloud. Anders was not available, but Craig Sewell and Anna Allen were able to show us the affected trees and discuss insect and disease issues and treatment options.

Observations and Discussion

There were many trees with symptoms of Diplodia blight scattered across the compound Figure 1). These trees have been tagged by the Forest for monitoring. Diplodia blight is a common fungal disease of stressed conifers, especially pines, caused by the pathogen *Sphaeropsis sapinea.* It is common in northern California and is often seen following wetter than normal springs at the time of bud break when the pathogen infects and kills the new needles. Moist environments can help Diplodia persist. The damage caused by this disease is most severe on old or weakened trees. Old trees or trees exposed to unsuitable growing conditions, mechanical injury, or damage by insects may eventually be killed.

This fungus is present throughout the year in dead needles and twigs located either on an infected tree or on the ground. Small black fruiting bodies mature during late spring or early summer in this material. These fruiting bodies sporulate during wet conditions and are scattered by wind, splashing rain, animals, or pruning equipment. Spores that land on

NORTHERN CALIFORNIA SHARED SERVICE AREA
3644 AVTECH PARKWAY, REDDING, CA 96002
(530) 226-2437

Cynthia Snyder
clsnyder@fs.fed.us

young needles and germinate produce the fungus that enters the needle through a stomate (or pore) and grows toward the base of the needle. Within a few hours, a brown area

Figure 1. Diplodia blight on ponderosa pine.

develops near the point where the fungus entered the needle. The fungus continues to grow into the twig. The progressive invasion of the twig by the fungus results in browning of the attached needles and canker production in the twig.

Management options include pruning and sanitation of blighted twigs. Since fungal spores can be transported to healthy twigs during the pruning process, prune when the tree is dry and disinfect pruning tools before each cut by swabbing the cutting blades with a solution of 70% rubbing alcohol. Rake up all blighted needles, twigs, and cones which harbor the fungus and destroy or discard them. We recommended that the trees that have

Diplodia be photo-monitored and closely observed for western pine beetle attack. Bill suggested coring the trees to see if there is a reduction in radial growth due to the blight.

A list of fungicide sprays was provided by Phil Canon, however, it is my recommendation that a spray would be inadvisable due to the cost of treating the crowns and the risk of drift, especially with the creek next to the compound. There may be injectable fungicides that could be effective the one that comes to mind is propiconazole (Propisol®). Remember that a certified pesticide applicator is required for this option.

Several of the pines on the compound had brooming caused by both Elytroderma needle cast (Figure 2) and western dwarf mistletoe (Figure 3). Elytroderma brooming looks

Figure 2. Elytroderma needle cast on ponderosa pine.

similar to dwarf mistletoe but without the dwarf mistletoe plants. Elytroderma needle cast is caused by the fungus *Elytroderma deformans*. Perennial infections on vigorous

branches often cause small to large compact brooms with upward turning branches often with dead needles.

The spores of Elytroderma typically infect needles in late summer and fall, but also occasionally in spring, following rainstorms. During wet conditions, spores germinate and penetrate young needles. The fungus grows within the needle tissue and eventually invades twigs and becomes systemic within the host, infecting new shoots and needles

Figure 3. Western dwarf mistletoe on ponderosa pine.

each year. The following spring, infected needles turn reddish brown, and by early summer, fungal fruiting bodies develop on dead needles if conditions are conducive. These fruiting bodies, which appear as black, elongated lines or slits, split open during wet weather and release spores. Dry spring weather tends to suppress spore production

and infection. Infection is favored by dense stand conditions and injury is greatest on poor crowns.

Western dwarf mistletoe, *Arceuthobium campylopodum*, was identified in many of the pines around the compound. Dwarf mistletoes are small, leafless, parasitic plants. They are entirely dependent upon their hosts for water, nutrients, and support. This parasitism causes stress on the host tree making it susceptible to attack by other insects and diseases. A potential treatment for dealing with the dwarf mistletoe is to prune the infected branches.

There was a tree in the compound that had a fresh lightning scar running the length of the stem (Figure 4). The scar had recent attacks by red turpentine beetle, *Dendroctonus valens*, which commonly responds to stressed or injured trees. Red turpentine beetle peak flight and attack activity usually occurs in the spring to early summer, approximately when the lightning strike occurred. This beetle rarely kills trees in California, more often it weakens trees, predisposing them to attack by other bark beetle species, such as

Figure 4. Lightning scar on ponderosa pine.

western pine beetle. I recommend that the Forest monitor the tree for western bark beetle attack and address that if it occurs.

Western pine beetle, *Dendroctonus brevicomis*, is the most common threat to ponderosa pine in northwestern California. There were a couple of recently killed pines on the compound with western pine beetle galleries identified under the bark (Figure 5). There are generally two generations per year, but the number of generations is linked to the length of the growing season. Most of the time, the populations of these native insects are at low levels, and the beetles attack stressed, damaged, or weakened ponderosa pines. Trees damaged mechanically or by lightning are often targets of attack, as are diseased host trees. Western pine beetle populations often increase dramatically during periods of drought.

I recommended that the trees with Diplodia, since they are all tagged, be photo-monitored annually. I also recommended monitoring the diseased trees for western pine beetle attacks. If these attacks, evidenced by red pitch tubes or frass in the bark crevices, occur

Figure 5. Western pine beetle galleries under the bark of ponderosa pine.

while trees are still green, the trees should be immediately removed from the compound or at the very least debarked and bucked into four foot pieces to reduce risk of Ips infestation in the down material. For the trees that are already dead, removal according to the Region 5 Hazard Tree Guidelines is appropriate.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437.

/s/ Cynthia Snyder

CC: Craig Sewell, Anna Allen, Anders Dombrowski, Bill Woodruff, Chris Losi, Sheri Smith, Phil Cannon,